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AUTHOR Ridley, Dennis R.; And Others
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ABSTRACT

CNU Online is the computer-managed instructional delivery system of Christopher Newport University (CNU) (Newport News, Virginia). Fully functional to deliver online courses since fall 1994, CNU Online has undergone a thorough assessment as required in its original assessment plan. In the 1994-95 school year, the online population did not differ greatly from the university's student population as a whole: it was a diverse group of predominantly nontraditional adult learners. The assessment data collected were consistent with the view that courses taught online are becoming a more established alternative form of instruction at CNU. The courses appeared to be as rigorous, or more rigorous, than classroom courses, and student satisfaction and performance data, where available, were comparable to data from students enrolled in classroom courses. Students with prior online experience were more likely to choose the online option, and made better progress when they did. There was a relatively high withdrawal rate in online classes, which improved somewhat in the spring semester. Those who persisted in the online experience were usually satisfied, but they did report that it was intensive and demanding. The report also reveals that a reasonable attempt was made to follow the guidelines established for a phased implementation of the online course system. Eleven appendixes present additional information about online course takers and their achievement. (Contains 4 tables and 5 appendix tables.) (SLD)

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THE 1995 ASSESSMENT REPORT ON CNU ONLINE

Dennis R. Ridley
Director of Assessment & Evaluation

Buck G. Miller
Director of Public Administration

C. Harvey Williams, Jr.
Chair, Department of Government and Public Affairs

Christopher Newport University
October, 1995

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THE 1995 ASSESSMENT REPORT ON CNU ONLINE

PREFACE TO THE ERIC PRESENTATION

CNU Online is the computer-managed instructional delivery system of Christopher Newport University. Fully functioning to deliver wholly online courses since fall, 1994, CNU Online has just undergone a thorough assessment following the officially-approved "Assessment Plan for CNU Online." This following document, "The 1995 Assessment Report on CNU Online" is hereby offered for broad dissemination as a helpful contribution to the burgeoning field of online instructional delivery.

PREFACE

The 1995 Assessment Report on CNU Online followed the organization of the CNU Online Assessment Plan. This plan, approved on January 14, 1995, called for a "phased implementation," a goal which now has been amply fulfilled. This first year has been an intensive learning process, affecting CNU Online as a whole; no less, this process has affected assessment in particular. Preparation of the current report necessarily involved confronting several issues as to how online assessment could be most effectively carried out. Indeed, the experience of all who have contributed to online assessment will be considered in the revisión of the assessment plan, scheduled to be completed by December 15, 1995. That said, the original plan has served reasonably well in bringing about a thorough and provocative examination of CNU Online, as a medium of student learning, during its first year.

Organizing this report according to the assessment plan was useful in order to keep track of the sheer mass of data. To counter some possible fragmentation of perspective, owing to this abundance of material, the following abstract will attempt both to summarize and integrate the material that follows. What the abstract lacks in detailed support is corrected by the report as a whole; and what the latter lacks in holistic perspective is corrected by the former. Technical report material and tables found in the appendices provide even greater support for the conclusions of the report.

EXECUTIVE SUMMARY

Highlights

Extensive assessment data were consistent with the view that courses taught online are becoming a more established alternative form of instructional delivery at Christopher Newport University. Comparative data revealed that: (1) online courses were generally as or more rigorous in their expectations than classroom courses; (2) students with prior online course experience in the first course of a two-course sequence were well-prepared and made better progress in the second course than students in the corresponding classroom courses; (3) students with prior online experiences increasingly chose the online option when given the choice; (4) student satisfaction and performance data, where available, were comparable to data from students enrolled in classroom courses.

Background Data

During 1994-95 the online population was not much different from the CNU student population as a whole. It was an extremely diverse group of predominantly non-traditional adult learners, i.e. beyond traditional college ages of 18-22. There were slightly higher ages overall (mean between 29 and 30) and a somewhat larger percent (over 90 percent) of classified students. On average these students also were somewhat further advanced in their progress toward degrees than the student body at large.

Degree Productivity

In its first year of operation CNU Online made a modest contribution to the institution's degree productivity by helping students earn credits required for degrees received. The contribution to the BSGA degree, the first targeted degree program under CNU Online, was by far the most substantial. These conclusions were supported by an examination of May 1995 degree recipients and by other evidence regarding increased accessibility to courses in the curriculum (see below).

Student Retention

For the first year's evaluation the focus of study was on several essential parts of the University-wide issue of student retention. One issue was "course retention" or the comparison between online and classroom courses in students' persistence, after enrollment, through the course to completion. Another was "online retention" or the tendency of students to enroll in other online courses after having enrolled in one course.

I. Course Persistence

There was a relatively high rate of withdrawal (or low persistence) in online classes: 30 and 25 percent in the fall and spring semesters, respectively. While the rate improved by 5 percent from fall to spring, it remained about three times the University average. Comparable courses taught in the classroom generally had a much lower withdrawal rate as well.

Several things might explain the high withdrawal rate:

Students who persisted in online courses were generally satisfied and found the experience of comparable value to their classroom learning. But they also found the experience to be intensive and demanding. The problems of pace and demand were exacerbated for students new to CNU Online; they needed to familiarize themselves quickly with the system and solve any technical problems. Those who have had online experience have an advantage and perform better at least initially.

Other factors affected course persistence. First, students who were already enrolled in more than a full load and had nothing to lose by dropping one course (due to the billing policy) often chose to withdraw from an online course. Second, some withdrawals represented avoidance of a D or F grade. Third, some enrollees were relatively uninformed and underprepared for online courses and departed as soon as experience showed their expectations to be unrealistic.

II. Online-based Persistence

Online students averaged more course enrollments per person in the spring semester than in the fall semester. This average went from 1.26 to 1.47 enrollments (i.e. courses) per student--a statistically significant difference of nearly 20 percent--despite the influx of many first time online enrollees. Students' greater willingness to devote a substantial portion of their load to online courses suggested that students' sources of information about online gave them increased confidence. Perhaps CNU Online had become more widely known and acknowledged after one semester as a viable alternative means of instructional delivery.

The number of fall enrollees returning in the spring was substantial relative to the number of fall enrollees (approximately 38 percent). The online enrollment increase did not reflect lack of opportunity to enroll in corresponding classes offered in the classroom. Such opportunity was available in every case.

Returning students enrolled in more classes in the spring than they had in the fall. Their mean enrollments increased from

1.36 to 1.60 per student--a statistically significant increase. In addition, prior course success was a noteworthy factor. In general, returning students had a more prolonged exposure and a more successful experience than non-returning students overall.

Students who withdrew from an online course, at least in fall 1994, were not inclined to re-enroll in the same course online. The other outcomes were about equally divided among three other options: dropping or stopping out of the University, deferring the issue of enrolling in the course, or actually enrolling in the same or equivalent course for credit in a classroom. The low number who re-enrolled in the same online course compared to those who took the standard course suggested that students who withdrew tended to have problems with the method of course delivery more than with the course per se. These findings underscored the importance of helping students to be prepared and to know what to expect from an online class.

Accessibility

There was evidence that CNU Online increased the typical student's access to parts of the University curriculum. Even with the addition of a new residence hall in fall 1994, the student population at large remained a commuting population as far as classroom courses was concerned. This important service for many students was easily measurable in the students' savings of scarce dollars. Accessibility of University coursework to those with mobility problems stemming from a disability was a small factor overall.

Learning Outcomes

I. General Knowledge and Skills

CNU Online seeks to develop important general skills including (among others) skills related to problem solving, synthesis, argumentation, reading, writing and telecommunication. Based on students' responses on the CNU Online Instruction Evaluation Survey, their perceptions of their achievements in these areas were generally positive. In addition, online instructors rated student performance and learning in the areas related to general skills development substantially higher in online than in classroom courses.

II. Course-specific knowledge and skills

Students' development of course-related knowledge and skills was measured both directly and indirectly. On the Online Instruction Evaluation Survey, students responded positively (approximate 4 on a 5-point scale): (1) that the course helped to develop an appreciation of the historical development of the subject matter; (2) that the course helped in learning the

vocabulary and concepts of the subject as well as the appropriate objectives and values. Similar results were found in an online faculty survey.

There was also some comparative data for four courses (out of 12 offered during the semester). The essential conclusion was that the online students' performance was quite comparable to, and in some cases exceeded, that of their classroom counterparts.

III. Course Impacts

Students' performance in the second course of two-course sequences was studied to discover the comparative benefits (if measurable) of online course preparation. The data revealed that students with online prerequisite experience tended to have an advantage in the second online course in a two-course sequence over those students who did not have the online prerequisite experience. Due to insufficient numbers it could not be ascertained whether students with online prerequisite experience would perform in a classroom course (the second in a sequence) at a level commensurate with students with prerequisite experience in the classroom version of the course.

In lieu of the planned online-to-classroom comparison, students' progress within an online two-course sequence was compared with other students' progress within the same course sequence offered in the classroom. There was an obvious tendency for online students to stay the same or improve their grade in the second course, in contrast with a trend for more students enrolled in the classroom course to earn a lower grade in the second course.

Other student grade data suggested that these results were not primarily due to the facilitative effects of being familiar with online instruction or with a particular instructor. Rather the results were consistent with a view that emphasized the educational benefits of close and frequent interaction between student and instructor. The online environment provided a vehicle in which the instructor regularly and systematically gave feedback to develop the critical skills, understandings, problem-solving strategies, etc. which are essential to higher levels of study.

Student Satisfaction

The primary instrument for measuring student satisfaction with course delivery was the Online Instruction Evaluation Survey. This survey was designed to provide measurement which was comparable to the standard CNU Instruction Evaluation Survey which is used in virtually all classroom courses at CNU. Slight revisions to several of the items were required to make the Online Instruction Evaluation Survey appropriate to the online

learning environment. The means for both online courses as a whole were compared, showing that the IES results were roughly the same in most areas. Additional questions were added revealing overall student satisfaction concerning issues that applied only to online courses.

Concluding Comments

Supplementary assessment activities provided further evidence that essentially corroborated points made earlier in this report. These data were consistent with the view that courses taught online are becoming a more established alternative form of instructional delivery at Christopher Newport University. Students who enrolled in these courses and were unprepared or underprepared, or merely curious, found the experience intense and difficult. The first part of the course was crucial because, due to the intensity of the course, it was easy to fall behind and difficult to catch up again. Online courses were generally as or more rigorous in their expectations than classroom courses. However, the course expectations could differ in important ways from classroom courses. They reinforced independent learning, or encouraged those who were less independent to become more so. They also offered the potential for transportable modular presentations such as the Professional Writing Skills Module as one challenge to the traditional view of courses as compartmentalized, self-contained units.

Finally, this document served as evidence for assessing the adequacy of the current assessment procedures. Modifications and adaptations were made during 1994-95; however, this report documents that a reasonable attempt was made to follow the guidelines of the plan and carry out a "phased implementation" as called for. The report also documents problem areas including the needs for: 1) more high quality comparative data on course-specific student learning; 2) more data on measures of general knowledge and skill development through online instruction. Expansion of the scope of assessment studies also would be highly desirable but should be weighed in the light of available resources.

THE 1995 ASSESSMENT REPORT ON CNU ONLINE

Assessment of CNU Online was based on viewing the program as integrally related to the CNU institutional context. Assessment, so viewed, can be carried out less intrusively and with generally greater acceptance and effectiveness. Assessment data were also intended to inform and have a positive influence on the institution. An extensive study comparing online and classroom students may be viewed as part of a larger effort to better understand our student clientele. The first step in such study is the comparison of demographic characteristics which form the context for further discussion of online and classroom differences.

Further, evaluation in this plan takes place within the institutional context, deriving information from four distinct levels, and in turn potentially informing the institution in a number of ways. These levels include (from broadest to narrowest):

- Level 1: Online program/institutional efficiency
- Level 2: Learning Outcomes
- Level 3: Teaching effectiveness
- Level 4: Student satisfaction with course delivery

Assessment data from several supplementary sources are also presented. Finally, the assessment process itself was briefly reviewed.

DEMOGRAPHIC SUMMARY OF ONLINE ENROLLEES

The study and comparison of online and classroom demographic data resulted in the general conclusion that during 1994-95 the online population was not much different from the CNU student population as a whole. It is an extremely diverse group of predominantly adult learners. There is some suggestion of slightly higher ages overall and a larger percent of classified students. To a slight degree, but only slight, on average these students may be further advanced in their progress than the student body at large. More advanced students present a good match to a number of the higher-level courses offered online.

Several findings here could not have been anticipated one year ago. <u>One of the most important findings was the large preponderance of students from the traditional CNU service area--a fact which might underscore the need for sophisticated marketing efforts at a distance</u>. Another finding was that the

number of declared disabilities in this student group was small, despite the fact that the original budget initiative had that population as one target.

In the following the specific findings are summarized by demographic categories:

Age: Ages of participants spanned a wide range. The mean age was between 29 and 30 years. There was no noteworthy change in average age between the fall 1994 and spring 1995 semester. This average was higher than the campus mean but the variation within participant ages overshadowed this slight difference.

Ethnic Status:
Approximately 78 percent of the enrollments were White and about 17 percent were African-American. A small number were Hispanic, Asian or Other. Again, this result is quite comparable to the campus-wide breakdown of enrollments by ethnic status (e.g., 76 White and 16 percent African-American.)

Gender:
Males comprised 44 percent of the enrollments and females 56 percent. This was comparable to the campus-wide division of 39 vs. 61 percent.

Handicapped and Veteran Statuses:
Less than 1 percent of the enrollments indicated some (mostly unspecified) disability on their applications for admission. Only one wheel chair-bound enrollee was found. Approximately 5 percent indicated veteran status. These numbers were typical for CNU students.

Locations:
The majority of students reside in the Virginia Peninsula area, i.e. the traditional service area of CNU. Approximately 57 percent were from Newport News and Hampton in spring 1995. This compared with 47 percent in fall 1994. A small number were from more distant locations--only 2 or less than 1 percent from out of state. These results were quite comparable to the campus-wide statistics (approximately 52 percent in Hampton/Newport News).

Status/Level:
Students enrolled in CNU Online during 1994-95 were overwhelmingly degree-seeking students. Only 8 percent of the enrollments were unclassified while 91 percent were classified. The small remainder had an audit status. The campus-wide statistic was slightly higher at 12 percent. In terms of progress towards a degree,

approximately 70 percent of all students (including the few unclassified) were in the upper classes (junior and senior) and approximately 50 percent were seniors.

Transfer Status.
The large majority of students (approximately 67 percent, based on a random sample of 58) had transferred credits into CNU upon admission, but this result was not very different across the campus.

Differences by Course:
For each of the above background characteristics, students grouped by course were examined to determine whether there were any systematic non-chance differences. No such differences were identified.

LEVEL 1: ONLINE PROGRAM/INSTITUTIONAL EFFICIENCY

The assessment under Level 1 attempted to address the success in meeting the following five goals:

1. Degree productivity will be enhanced.

2. Student retention will be increased.

3. Accessibility for students with financial and mobility problems will be enhanced.

4. Cost effectiveness and operational efficiency will be enhanced.

5. Student learning and academic advising will be enhanced as shown by analysis of archival information from the digital environment.

Degree Productivity

In its first year of operation CNU Online made a modest contribution to the institution's degree productivity by contributing courses required for degrees received. This conclusion was supported by an examination of May 1995 degree recipients (including those who completed requirements in December 1994). See the table listed as Appendix 1.

Of the graduating seniors, 37 had been enrolled in wholly online courses during 1994-95. Discounting 5 who were enrolled in single courses and withdrew or did not receive a passing grade, there were 32 for whom some contribution was made to degrees granted. All but three of these completed requirements in spring 1995; those three completed their requirements in December, 1994.

Thus, online courses made a small contribution to several degree programs in the program's first year. The contribution to the BSGA degree, the first targeted degree program under CNU Online, was by far the most substantial. The 14 BSGA graduates (all of whom completed degree requirements in spring 1995) used some credits from online courses to make progress toward the BSGA degree. They represented 39 percent of the 36 graduates who received that degree in May 1995. Given that a number of these graduates may have completed their requirements prior to spring 1995, or did not need any of the online courses, this percentage is fairly impressive for the first year. Reasonably, it can be expected to rise in future semesters.

Student Retention

The CNU Online initiative has predicted that online instruction would have a long term positive effect on student retention at the University. The study of this impact is part of the larger study of student retention at the University which is ongoing at this writing. For the first year's evaluation, therefore, the focus of study was on several essential parts of that problem. One issue is "course retention" or the comparison between online and classroom courses in student's persistence, after enrollment, through the course to completion. Another is "online retention" or the tendency of students to stay with online courses after having enrolled in one course. As a practical matter, the extensive studies of these issues focused on the two previous completed semesters of CNU Online.

I. Course Persistence

There was a relatively high rate of withdrawal (or low persistence), in online classes, averaging between 25 and 30 percent in the fall and spring semesters. A complete presentation of the relevant data by course and by semester are found in Appendix 2. The rate improved by approximately 5 percent from fall to spring, but remained about three times the University average. Comparable courses taught in the classroom generally had a much lower withdrawal rate as well.

The phenomenon did not in any obvious way visit particular instructors or disciplines more than others; it was a general phenomenon of online instruction and was a challenging one to interpret. The following is an interpretation that took into account a variety of findings.
(See also Appendix 3.)

Students who persist in online courses are generally satisfied and find the experience of comparable value to their learning in the classroom environment. However, they also find the experience to be intensive and demanding. They are called upon to be in frequent online communication with the instructor

and their peers. They find the subject matter with which they must deal to be at least as difficult, or more difficult, than their counterparts in classrooms. Most students find out quickly that in this type of instructional milieu they cannot "get by" if they let their work slide. They cannot hope to make up for absence from the task by three or four major cram sessions during the course. Moreover, a student who falls behind the pace quickly becomes obvious to both the instructor and other students. The problems of pace and demand also are exacerbated for students who are new to CNU Online since they need to become familiarized very quickly with the system and solve any technical problems. Those who have had online experience have an advantage and tend to perform better at least initially.

The money students have invested in a course is generally an important, un-wastable commodity. Since students lose that investment by withdrawing, they will try to remain to the end. However, there is a category of students who do not stand to lose by withdrawing, namely, those who enrolled for 15 or more credits. Such students could very easily adopt a strategy which says, "Enroll in more courses than you would ordinarily be able to handle. If you can handle it, great; if you have to drop a course, also great; there is no loss." Such students spend the first part of the semester looking over their course schedule to determine which, if any, they will have to drop. If they are new to CNU On-Line, they will find the experience sufficiently different and demanding that the course will become a prime candidate for dropping. Their counterparts in the classroom courses might adopt the same strategy. However, they will more likely persist in their course since it will not become clear as quickly whether they can make it through.

Students who persisted in and passed an online course have had to learn not only course material but also the (for many) novel rules of participation. As time proceeds, more students will become repeaters and will not have to relearn the rules. Also, as CNU On-line becomes better organized to assist new students, more students should find a smoother path of adjustment to the system. Perhaps some of the modest improvement in course persistence from fall to spring was due to such improvements. However, because the experience is so intense those who do not make quick adjustment, if they do not withdraw, will fall behind even faster than they would in the classroom. There at least they know the rules. The resulting high failure rate can be a problem.

There may be room for other explanations to apply to for different students and circumstances. One might be called the "migration" hypothesis. When students exercised the option to withdraw, a certain number might have done so to avoid an unsatisfactory outcome such as a D, F or the change to an audit (AU) in lieu of credit. In effect, the higher online withdrawal

rate might be explained as migration of students from one type of unsatisfactory category (e.g., D's) to another (W's).

However, the data contradicted this hypothesis as a general phenomenon. (See Appendix 4.) Students probably did not usually exercise the withdrawal option based on their anticipation of a worse outcome if they did not. In particular, the consistent appearance of more F's in the records of online enrollees is at variance with this suggestion. In essence, higher withdrawals from online courses accounted for the largest single online/classroom difference with respect to less than satisfactory grade outcomes. However, in view of the consistently smaller number of D's in the online classes, there was limited support for the suggestion that some students who anticipated receiving less than a C withdrew from the course to avoid that outcome.

II. Online-based Persistence

This term referred to the tendency for students who had taken an online course or courses to persist in taking such courses in future terms. There will be at least two manifestations of online based persistence: a) the enrollees who pass courses in one term will tend to repeat as enrollees in a following term, even when the courses they select are offered in the classroom as well as online; b) the enrollees who have repeated will also tend to take more courses online per student.

Prior to looking at these data, other findings suggested that online-based persistence probably had increased. For example, there were indications that students' selections of online courses were an expression of their prior satisfaction with online courses. Data regarding student enrollments matched their self-reported (on the Instruction Evaluation Survey) overall satisfaction (see below) with the courses they completed and overall preference to take an online course again if given the opportunity.

While enrollments and headcount enrollees both went up considerably from fall 1994 to spring 1995 in online classes (264 and 230 percent respectively) the former outstripped the latter. This reflects the fact that students averaged more enrollments (i.e. online courses) per person in the later semester. This average went from 1.26 to 1.47 enrollments per student--a statistically significant difference of nearly 20 percent--despite the influx of many first time online enrollees. This finding by itself suggested that CNU Online had become more widely known and acknowledged after one semester as a viable alternative means of instructional delivery.

However, the finding raised new questions. How many of the spring enrollees were returning students who had enrolled in the

fall? What was the percent of fall enrollees who returned in the spring for one or more online classes? For those returning students, were the courses they took offered uniquely online, or were they also available at a variety of times in the traditional classroom setting? Did the returning students enroll for a larger number of online courses than they had in the fall? What was the effect of students' relative success as measured by grades?

First, the number of returning students was small relative to the total number of students who enrolled in the spring (approximately 17 percent), due to the many newly recruited enrollees in the spring. However, the number of returnees was substantial relative to the number of fall enrollees (approximately 38 percent).

Second, the courses offered online in spring 1995 were available (by policy) in at least one other section taught in the classroom. In some courses the number of classes and the variety of times considerably exceeded this minimum.

Third, returning students did enroll in more classes in the spring than they had in the fall. Their mean enrollments increased from 1.36 to 1.60 per student--a statistically significant increase.

Fourth, the question of the effect of prior course grades on returning enrollments also was addressed. Students who returned for the spring, compared to students who enrolled only in the fall, tended to have different experiences as shown by their fall online grades:

	MULTIPLE COURSES TAKEN WITH PASSING GRADES IN AT LEAST ONE	NO. WHO RECEIVED AT LEAST SOME CREDIT FROM THEIR ENROLLMENT(S)
FALL '94 ONLY	1 OUT OF 64 STUDENTS = < 2 PERCENT	32 OUT OF 64 STUDENTS = 50 PERCENT
FALL '94 & SPRING '95	11 OUT OF 41 STUDENTS = 26.8 PERCENT	33 OUT OF 41 STUDENTS = 80.5 PERCENT

The returning students were more likely to have ended the term having received some credit for their online enrollments; and the returning students were also more likely to have attempted multiple courses in the fall and passed at least one.

Thus, returning students had a more prolonged exposure and a more successful experience than non-returning students overall.

III. Linking Course Persistence and Online Persistence

A small study examined the individuals who had withdrawn from one or more CNU Online classes in fall 1994. (See Appendix 5.) The purpose was to examine whether they followed up in later semesters with enrollments in the classes they dropped. Did they take the class online or in the classroom, given a choice? This study attempted to determine whether the withdrawals were mostly related to the course, the method of delivery, or extraneous factors.

The availability of courses, both online and classroom, was germane to this study. Since some of the courses were offered alternate semesters, it was necessary to expand the scope of the inquiry to a third semester (fall 1995) so that a more complete cycle of course offerings, both online and classroom, was available to the students.

The following categories were used:

CATEGORY	FREQUENCY	COMMENTS
I. DROP/STOP OUT	9	A case of suspension may be included.
II. ENROLLMENT ONLINE	2	One A; the second case is ongoing.
III. ENROLLMENT IN THE CLASSROOM	9	(Two enrolled in languages other than Spanish)
IV. NO RECORD OF COURSE ENROLLMENT	10	To date the requirement is unsatisfied

The data presented above strongly suggested that students who withdrew from an online course, at least in fall 1994, were not inclined to re-enroll in the same course online. The other outcomes were about equally divided among dropping or stopping out, deferring the issue of enrolling in the course, or actually enrolling in the same or equivalent course for credit in a classroom.

The low number who elected to re-take the online course compared to those enrolled in classroom sections suggested that students who withdrew tended to have problems with the method of

course delivery more than with the course per se. Since the course from which the student withdrew always was offered online during the two-semester follow-up period, the opportunity was available for students. With online courses, work or other scheduled activities cannot have been the major issue.

These findings underscored the importance of helping students to be prepared and to know what to expect from an online class. There appeared to be an initial period of adjustment to online for students like these who had never taken an online class before. If they were not properly prepared, they were in for a rude awakening. Under those circumstances there was a strong likelihood that those students would stay away from online classes ever afterwards.

Another possibility is that the novelty of CNU Online interacted with a student's preparedness for online instruction. Like any educational innovation, CNU Online has had and will have its detractors. Students who had an initial difficulty with an online course might have proved quite open to these negative judgments. Such evaluations possibly provided a convenient "story line" to account for their experiences. If so, one might predict that as CNU Online becomes even more established as a viable alternative for students, there will be less tendency for students to stay away from online courses after one brief encounter. In addition to the increasing numbers of multiple enrollments by students, a decreasing number of brief, casual encounters with online instruction could be a mark of increasing program stability in the future.

Accessibility for students with financial and mobility problems

The low number of students with disabilities in online classes was revealing. It suggested that increasing accessibility of University coursework to those with mobility problems was a small factor overall. Such students exist in small enough numbers within the traditional service area; of those, the number who were aware of the program, needed the courses or credits, and had access to a computer at home apparently was vanishingly small. While the benefit to the few was great, increasing their access substantially from close to zero, service to the disabled was all but invisible as a general feature of the program. The expansion of this service to match this part of the original vision will depend upon further marketing efforts to reach far beyond the immediate geographical area.

However, there was evidence that CNU Online increased the typical student's access to parts of the University curriculum. Even with the addition of a new residence hall in fall 1994, the student population at large remained a commuting population as far as classroom courses was concerned. This was the major

breakthrough for many students that is easily measurable in the savings of scarce dollars. The locations of students and the miles they would need to travel to classroom-taught equivalent courses are known data. Making conservative assumptions along these lines, such as an average of two round trips per class per week, equated to a savings of over 150,000 highway miles in the most recent completed semester alone.

Another dimension of accessibility is time. Scheduling conflicts are common for students who work, as most CNU students do. (A recent survey of graduating seniors found that 100 percent were working, 78 percent of those full-time.) Such conflicts can add considerable time to a student's academic career. Since CNU Online enables students to overcome all such conflicts, it is reasonable to anticipate the effects over time in the greater efficiency of students' making progress toward the degree. Indeed, as demonstrated above after only one year 32 graduates--14 of those within a single targeted program-- were identified for whom CNU Online had contributed to their degree attainment.

Students' responses on three questions on the CNU Online Instruction Evaluation Survey confirmed the above conclusions. On a 5-point scale, students responded 4.19, 4.02, and 3.67, respectively, to the following questions:

> It is more convenient for me to take this course online than in the classroom.
>
> Online courses are necessary for me to complete an undergraduate degree.
>
> Cost is a factor (scheduling, travel, etc.) in taking online courses.

Cost effectiveness/operational efficiency

The analysis and report, designed to provide an objective test of progress with respect to this goal, will be separately prepared and disseminated by June 30, 1996. This analysis will take into account the entire fiscal history of CNU Online through 1994-96.

Student learning revealed in course archives (message logs):

As stated in the CNU Online Assessment Plan: "This area represents a serious objective for scholarly research which is likely to pay great dividends for practical application. The existence of extensive message logs of the CNU Online course experience provides a marvelous opportunity. However, this interest is long-term and will receive lower priority during the initial phases of program implementation."

An initial pilot study project has begun and probably will be presented at the fall 1995 Virginia Assessment Conference in Lynchburg, Virginia, November 8-10, 1995. Professor Roark Mulligan of CNU's Department of English has taken the lead on this project.

LEVEL 2: LEARNING OUTCOMES

The assessment plan called for the generation of direct evidence of attainment of student outcomes of two types: first, general skills that crossed over many different parts of the curriculum, and second, knowledge and skills that are specific to the course. Particularly with respect to the latter, comparative information (online vs. classroom) was sought wherever possible.

General Skill Development

General skills that CNU Online seeks to develop include:

1. Learning to read, interpret, and critique written texts without oral interpretation.

2. Learning to write clearly, analytically, and persuasively within a conceptual framework.

3. Learning to work with peers creating problem-solving documents and form cohesive groups.

4. Learning to use technology.

5. Learning to be independent learners.

With regard to these general skills, to date the evidence gathered and analyzed are indirect. Students responded to 17 questions on the CNU Online Instruction Evaluation Survey (IES) including several which were uniquely targeted to measure attainment of the above objectives. These questions could not be compared with classroom respondents since they were uniquely part of the CNU Online IES. (A complete tabular data summary is presented in Appendix 6.) Student perceptions of their achievements in these areas were generally positive. On a 5-point scale, responses on items related to objective number 1 averaged about 3.79. These responses suggested that students believe they have enjoyed benefits with regard to problem solving and inferential skills and in reading skills in general. Responses related to objective number 2 averaged 4.06, suggesting that students believed their writing skills had been developed. Regarding objective number 3, students' responses averaged 3.66; they perceived growth in the ability to work productively with others and resolve controversies, while tolerating others' viewpoints. With regard to objective number 4, students clearly perceived growth in telecommunication skills and in computer

software skills (averaging 4.10). No question was directly related to objective number 5.

During summer 1995, 12 of 17 online instructors returned a faculty questionnaire, part of which was devoted to satisfaction with student performance and learning. The survey and summary responses for this section are found in Appendix 7.

The first eleven questions concentrated upon student performance and learning. The mean for these questions was 4.1 on a scale of 1 (lower than classroom performance) to 5 (higher than classroom performance). Online instructors rated online student performance and learning in the areas related to general skills development substantially higher than classroom outcomes. Means generally were in the four to five range.

With regard to students becoming independent learners, it is noteworthy that faculty uniformly gave the highest rating to question number 8: "Overall, do you believe online students participate more or less in course discussion than in comparable classroom courses?" This finding suggests that online courses engender high levels of involvement and initiative among students. This possibility is noteworthy and its implications should be explored further.

The possibilities for analyzing message logs directly to measure these areas, particularly development of writing skills, are currently being explored. In addition, direct testing of critical thinking skills online was addressed and an attempt was made to construct a reasonable instrument for pilot testing purposes. However, the effort foundered on the technical issue of creating a scroll-back feature so that students could review lengthy passages that filled more than one screen. Furthermore, students' patience with extensive testing had already been stretched. The technical problem and other issues will be re-addressed at a later time.

Course-specific Knowledge and Skills

Students' development of course-related knowledge and skills was measured both directly and indirectly. On the Online Instruction Evaluation Survey, students responded that the course helped to develop an appreciation of the historical development of the subject matter (3.81); they also responded that the course helped in learning the vocabulary and concepts of the subject (4.11) as well as the appropriate objectives and values (4.10). Similar results were found in the online faculty survey.

Direct and mostly objective testing was also attempted during spring 1995; much of this testing, as directed by the assessment plan, was also unit- or module-based. This program met with mixed results. The problems encountered were discussed

at length with the Provost, the main points of which have been appended to this report (Appendix 8). A primary finding was that non-graded assessment was not being taken seriously by many students; therefore an unusual and unacceptable rate of random or careless responding was evident in much of the data. This finding led to a decision supported by the Provost to move toward embedded assessment and to dispense with pretests. (A consultant from Behavioral Technologies, Inc., Dr. Edward Smith, had earlier recommended that these changes be made in the assessment procedures for CNU Online.)

For these reasons, good quality comparative data, offering direct evidence on student learning outcomes specific to courses, was in short supply during spring 1995. However, there was some comparative data for four courses (out of 12 offered during the semester). A summary of these findings is found in Appendix 9. The essential conclusion was that the online students' performance was quite comparable to, and in some cases excelled, that of their classroom counterparts. When students in comparable classroom sections were tested using the same or similar tests and procedures, the online students performed comparably. There was also some evidence that the performance was superior when the test format called for writing and a critical response.

Analysis of Prerequisites or Course Outcomes

The relative lack of direct test evidence of student achievement in specific course learning outcomes led to adoption of an innovative approach toward assessing the effectiveness of student learning. This method was proposed in the assessment plan as one of the "collateral" methods; however, the results of the analysis spawned the realization that this method bears directly on the issue of effective student learning of essential course-related knowledge and skills.

Study No. 1

This study (Appendix 10) examined the question of how students performed in spring courses for which the prerequisites could be taken in the fall either online or in the classroom. There were three courses offered in the fall in both modes which were first courses in a two-course sequence where the second course was offered in the spring: English 101, English 207G and Spanish 101. The corresponding courses offered in the spring were English 102, Spanish 102, and English 208G. (The term "prerequisite" may be inaccurately applied in some instances; e.g., English 207G was not strictly a prerequisite for English 208G, but it was included here as the first course in a two-course sequence.)

Part I of this study looked at those who had enrolled in the second course online. Given that the second course was taken online, how many enrolled in the prerequisite online versus in the classroom? Further, how did students perform depending on whether they had taken the online or classroom version of the prerequisite?

The data revealed that when sufficient numbers of fall online students returned for a second online course in the spring to permit a statistical comparison with those whose prerequisites were taken in a classroom section, performance in the course tends to favor those with the online prerequisite experience.

However, the interpretation of Part I by itself was ambiguous. It was unknown from these results alone how much the statistically better performance of the students with the online experience could be attributed to experience with the BBS system and online pedagogy versus the learning which presumably occurred through the online vehicle. Therefore, a Part II was logically required because it was essential to know how well the students with online experience (in the prerequisite) might do in a classroom course for which the first course was prerequisite. Would these students' performance be comparable with traditionally taught students in the same course?

However, due to the relative newness of CNU Online, the plan that was designed to provide an answer to the above question has so far failed to provide such an answer. Based on the two semesters (94-95) alone, only one person who had taken the prerequisite online enrolled for the second course in the classroom mode. While this individual clearly was not disadvantaged by the online prerequisite, one person of course could not provide enough data to draw a strong conclusion. As more terms of online experience accumulate, it will be possible to gather sufficient data to test whether students with the online experience perform comparably on a second (classroom) course for which the online course was prerequisite.

Nevertheless, while it is not yet possible to test by this method how well students have performed in traditional classes (as a function of online versus standard classroom prerequisites), another worthwhile observation may be made from this study. This observation concerns students' enrollment choices. It is noteworthy that of the students with prior online experience, if they enrolled at all in the second course in the following semester, they tended to choose the online mode again. In fact, this pattern, noteworthy as it is, deprived this study of the chance to observe online students in a second classroom course in sufficient numbers to make an appropriate statistical test.

In summary, students with online prerequisite experience tended to have an advantage in the second online course in a sequence over those students who did not have the online experience. Due to insufficient numbers it could not be ascertained whether students with online prerequisite experience would perform in a classroom course (the second in a sequence) at a level commensurate with students with classroom prerequisite experience. This lack of numbers, however, was due to an apparent tendency for students who enrolled in a second course in a sequence to choose the online mode if they had taken and passed the first course in that mode.

Study No. 2:

Given the lack of numbers necessary to do an online-to-classroom comparison of grades (received in the second course as a function of the type of prerequisite), the alternative was to compare the progression of classroom-to-classroom students with the progression of online-to-online students. Did the latter students show progress comparable to the former?

There were three courses which offered a two-course sequence from fall to spring both online and in the traditional setting. Of the three only two of them offered the possibility of the comparison described above; the third had none of its five students from the fall repeating the second course in the spring.

The first test was related to the transition from Spanish 101 to 102. For this purpose a particular section of Spanish 102 which was taught in the classroom in the spring was selected. The distribution of grades in this course for this professor was fairly typical for this course sequence and thus provided a fair basis of comparison. Spring grades were available; 101 grades were taken mostly in the previous fall. Ten classroom and nine online students grades provided the basis of the test.

These data suggested a dramatic difference in the preparedness of students for the second course as measured in terms of grade progression from the first to the second course. Consider the results in the following table:

GRADE PROGRESSION TEST FOR SPANISH 101-102	GRADE EQUAL OR INCREASE	GRADE DECREASE	TOTAL
CLASSROOM SEQUENCE	2	8	10
ONLINE SEQUENCE	7	2	9
TOTAL	9	10	19

There was an obvious tendency for online students to stay the same or improve their grade in the second course, along with an equally obvious opposite trend for the classroom students. Due to small numbers a special test called Fisher's Exact Test of probability was done. The difference was statistically significant at an extremely low probability.

A second comparison was done for the English 207G to 208G sequence. Again one classroom section was selected for comparison, and the grades were obtained as before. The distribution of grades in this course was fairly typical for this course sequence, providing a fair basis of comparison. The results of this comparison are shown below:

GRADE PROGRESSION TEST FOR ENGLISH 207G-208G	GRADE EQUAL OR INCREASE	GRADE DECREASE	TOTAL
CLASSROOM SEQUENCE	9	10	19
ONLINE SEQUENCE	4	0	4
TOTAL	13	10	23

These results are more ambiguous. If anything there might be the same tendency noted before for online students to continue to perform as well or better in the second course; but students in the traditional setting are as likely to perform at the same or higher level as they are to decrease. Indeed the Fisher's Exact Test was inconclusive, showing a probability of .08--enough to suggest there may be something to this comparison but not enough to reach the traditional .05 alpha-level of significance. A second test using a fair sample of students selected at random, who took the course at various times from various professors, provided an essentially identical result of .07.

Overall the results suggested that students' grade progress through at least the Spanish course was strong. Grade progress through the English course sequence was suggestive but not proven. The language course places a strong premium on developing the skills and command of syntax and vocabulary. These foundations are particularly critical in an introductory course such as Spanish 101-102. (Verbal skills are another matter that required, and received, additional creativity through supplementary methods.) Sequential learning is less evident in the literature courses. A professor explained that one course is not strictly a prerequisite for the other, and they can be and are sometimes taken out of sequence. However, the readings are

generally more difficult and the expectations for performance higher in 208G.

Alternative Explanations of Findings

The potentially important implications of the studies on prerequisites suggested the need to address alternative explanations as fully as possible with the data available.

A further question was raised regarding the progression of students in sequenced courses such as the three courses studied in this phase. Was the progression merely due to familiarity with the online system as opposed to the effectiveness of the instruction? If there is a general enhancement that has nothing to do with learning the subject matter, one then would expect to find online GPA's increase from one semester to the next among those who enrolled in courses in both semester. This possibility was tested with 42 individuals who had enrolled in classes in both fall 1994 and spring 1995. The various outcomes were as follows:

ONLINE GPA went up:	13
ONLINE GPA went down:	14
ONLINE GPA stayed same:	10
No test possible*	5
TOTAL	42

* (e.g., person went from no grade to grade(s) or had only audits in each semester)

These results could be characterized as a "wash." They suggest that a student's grade performance does not automatically increase from having had experience with online instruction. Therefore the satisfactory grade progression from one semester to the next which was noted for the sequenced courses was more likely due to the preparation that the students received in the earlier semester.

Other evidence is relevant to the question of whether satisfactory progress within online sequenced courses is due to extraneous factors besides familiarity with the system. Evidence presented above suggested that online experience alone could not account for maintenance of grade performance in a second course. Another extraneous factor is the ongoing relationship with the same instructor. A skeptic, reviewing the observed satisfactory grade progress in online courses, might suggest that the instructors (who were the same within each online course sequence) were hardly disinterested and unbiased; having already established a relationship online with their continuing students might at some level have predisposed them to favor those students. Purely for the sake of argument let us

assume this rather cynical view was correct. If so, it would be supported by student grades in the second course which were noticeably out of line with the students' other general grade performance. The suggested empirical check was in fact performed.

Again, the evidence suggested a "wash." In nine cases where data were available the second semester online grade was above the student's CNU GPA six times and below three times. No statistical test was possible on this small group. This test merely pointed out that second grades were not remarkably discrepant from what one would expect given the students' overall grade performance.

Another alternative suggestion was that it is the type of student, not the online preparation, that allows students to succeed in online courses. This possibility implies that there are differences between online students and classroom students; and indeed there are. However, from the earlier section on demographic characteristics it appears that the differences are not strong or obvious. This fact militates against the suggestion. Nonetheless, it might be that some differences such as the amount of academic experience and progress towards the degree point to a variety of commitment that is crucial interact with online preparation to help students with online experience to succeed in later courses.

Discussion of Prerequisites Study

The results reported above were consistent with a view that would emphasize the educational benefits of close and frequent interaction between student and instructor. The elements of such interaction include the instructor's attention and interest in determining what the student understands and does not understand, or between what the student can and cannot do. The instructor closely monitors and provides continuous feedback to assist in developing the critical skills, understandings, problem-solving strategies, etc. The online environment provides a vehicle in which such interaction can take place regularly and systematically. Thus, with online instruction the preparation that a first course in a sequence is supposed to provide for a more advanced course might have a greater likelihood of occurring.

It is worth emphasizing that the traditional classroom course frequently has more ambiguous results in its preparation of students for a second or more advanced courses in the curriculum. When students' performance is not as closely monitored and evaluated, they tend to have a more truncated view of the curriculum. They try to survive by completing the next assignment, the next test, the next course. When they fall behind, they tend to stay behind and fall by the wayside. Poor

and hit-or-miss preparation results in lower average grades in following courses. (Supporting the argument of this section, the researcher found that grades for English 102 tend to be slightly but significantly (statistically) lower than for English 101; Spanish 102 grades similarly average slightly but significantly (statistically) lower than Spanish 101 grades, etc.) Close mentorship such as that provided through online instruction can reverse this trend toward fragmentation. A key variable is the presence of a mentor who assures that students understand and can apply what they need to know not only later in the course, but throughout the curriculum.

LEVEL 3: TEACHING EFFECTIVENESS

The CNU Online Assessment plan called for the peer group for each faculty person to review a copy of the message log for the courses taught by the candidate. The instructor needed to document for the peer group specific examples in the course log supporting effectiveness in relation to various criteria relating to online teaching effectiveness. For evaluative purposes a rating scale was designed to measure instructors' success in meeting these criteria. Since the peer review process has not yet begun for 1995-96, this portion of the Assessment Plan has not been implemented. When implemented, the information generated will be useful for internal review and rewarding effective online instruction.

LEVEL 4: STUDENT SATISFACTION WITH COURSE DELIVERY

The primary instrument for measuring student satisfaction with course delivery was the Online Instruction Evaluation Survey. This survey was designed to provide measurement which was comparable to the standard CNU Instruction Evaluation Survey which is used in virtually all classroom courses at CNU. Slight revisions to several of the items were required to make the Online Instruction Evaluation Survey appropriate to the online learning environment.

The survey questions and means for both online courses as a whole and classroom courses are presented for comparison purposes in Appendix 6. The means indicated that the online and classroom IES results were roughly the same in most areas. Online results were slightly lower, but for an experimental program that demands of students both subject matter knowledge and computer skills, the means were not surprising and were commensurate with the other available data. The means for question number 13, "I found this professor to be an effective teacher in this course," were nearly identical.

An additional 17 questions were addressed to online students alone. (Some of these have been discussed above under "Learning Outcomes.") The mean responses on these items also revealed

positive perceptions regarding development of important skills through online instruction. Such skills included (among others): problem solving, synthesis, argumentation, reading, writing and telecommunication. Since these questions were not also asked of classroom students a comparison could not be made with online sections. The value of these data will increase as they continue to be collected in future semesters.

SUPPLEMENTARY ASSESSMENTS

Supplementary assessments were of two kinds. First, several were carried out which had been proposed in the assessment plan. In addition, several others were carried out as circumstances and opportunities presented themselves.

Activities from the Assessment Plan

Three methods were proposed under the heading of "collateral methods" in the assessment plan. The first, the analysis of the effectiveness of prerequisites, was reported above.

A second method involved occasionally inviting external consultants to consider assessment-related issues. This was done during the past year through inviting Dr. Edward Smith of Behavioral Technologies, Inc. Several of his recommendations are being followed, including changes in the assessment of student learning (referred to above) and the initiation of a pilot study of the message logs of one or more online courses. Thus, Dr. Smith advised on procedural and methodological issues rather than on student outcomes directly.

Another consultant who has served the CNU assessment program in the past, Dr. Robert C. Birney, limited his role to reading and commenting on this report.

A third method involved gathering data from the perspective of an individual or individuals who had enrolled in the same class, offered both online and traditionally. This activity was not carried out as originally conceived due to the lack of staff availability for this extremely labor-intensive activity. However, as Prof. Ronnie Cohen of the Department of Accounting had taken the two-course Spanish sequence both online (SPAN 101) and in the classroom (SPAN 102), her perspective was both rare and potentially helpful. It was rare in that she was the only person who could be identified who had enrolled in a fall-to-spring online/classroom two-course sequence.

Professor Cohen's reflections on the comparison between the two experiences has been summarized in Appendix 11. She identified the comparative benefits of online instruction as follows:

1. The online experience puts a high premium on students becoming independent learners and sustaining independent learning. She described this experience as "immersion"..."The kind of performance which is called for is much more demanding, and that is good from a learning standpoint."

2. Students find more individualized feedback and evaluation in the online course. Feedback is much more detailed and individualized than in the face-to-face classroom situation where it too often happened that some students could avoid participating in more than a perfunctory way.

3. Students benefit from the group work. The benefits result from students' role in teaching others, from the freer exchange of ideas, from even more individualized attention, and from students' greater willingness to risk revealing to their peers what they don't know so that they can learn.

4. Another advantage is increasing students' skill and comfort level in using computers, including overcoming any phobia of computers.

Turning to actual or potential disadvantages, Professor Cohen made the following observations.

1. It is extremely easy to get behind and not be able to catch up.

2. It is harder to find and exploit opportunities for conversation.

3. Finally, not having personal contact with other students is, according to Professor Cohen, in the big picture ultimately a disadvantage. Students also need to learn to function well in face-to-face situations--a goal that a digital learning environment cannot substantially help us achieve.

Dr. Cohen also taught an online course after she had completed her role as a student in the Spanish course sequence. However, she remained in essential agreement with her earlier observations.

Additional Activities

The following additional activities also shed some light on students and their interactions with CNU Online or tested procedures which may provide useful information in the future.

While the list appears to be the inevitable catch-all category, there were notable themes that emerged, raising new issues and suggesting new avenues for further exploration.

1. Independent Learner Analysis: the Learning Styles Inventory

2. Inspection of a student petition

3. Summary report from online telephone counselor, Ms. Ruth Kavanaugh

4. Data relevant to a possible "curiosity effect"

5. Comparative study of academic "rigor"

6. Pilot Study of a Professional Writing Skills Module

The list is by no means exhaustive; however, reporting still other activities probably would not much alter the conclusions as regards student outcomes.

- Independent Learner Analysis

The following sections are quoted from the discussion section of "Learning Style: Attitude and Performance of Independent and Dependent Learners," by Doerries, Rieg, Webb and Teschner. The paper examined characteristics of dependent and independent college students in CNU classroom and online courses in spring 1995.

"These data indicate that more independent learners are attracted to the bulletin board based learning environment. (12.97% for classroom and 24.80% for online courses)

It is interesting to note that while a particular type of student may be more attracted to one of the learning environments, this preference did not manifest itself in terms of the grades these students earned. The data are consistent with the results from a related study in which it was reported that faculty members with independent or dependent learning styles do not differentially reward students who are similar or different from their own learning style.

The online environment is expected to attract the more independent learner, but furthermore, it is intended to encourage and positively reinforce independent learning. The digital environment achieves this reinforcement by surrounding the student with accessible research material and electronic learning tools, rather than by having information presented by the lecturer, where the student is in a passive and dependent role. Students are also reinforced in the online environment when they

engage in independent learning by means of social interaction with their peers, since the currency that is valued in peer interaction is supplying and interpreting information that is useful in solving assigned problems.

Finally, online environments, even in the relatively simple form of bulletin board systems, provide a wide range of functions that enable the 'knowledge engineer' who is the teacher, to shape the learning behaviors of students."

- Inspection of a Student Petition

A petition related to CNU Online was signed by 460 students the spring semester of 1995. To paraphrase the text of the petition, it requested the CNU Administration to establish a classroom-based class to correspond with every online class. The petition asserted its support of that position but did not examine or offer debate regarding the current procedures or their possible justification.

The petition was on file in the Office of the Provost. The Provost (Dr. Summerville) made a copy available to the Office of Assessment from which a comparison was made of the signers at the time of the petition (spring 1995) and the rosters of online students as of that time (fall 1994 and spring 1995).

Two questions motivated the study. First, did signing indicate that the signers had direct experience with CNU Online? Second, to the degree that signers did have direct experience of CNU Online, was that experience negative? Registration data, i.e. grades and enrollments, were used exclusively to address these questions.

Of the 460 students who signed the petition, for a small number (15 or about 3 percent) it could not be determined whether they had taken online courses. Of the remaining 445 students, only 19 (or about 4 percent of the remainder) were identified who had taken at least one online class. These 19 students had enrolled in a total of 32 online classes during the period preceding the petition. Thus, the answer to the first question was that signing the petition was not indicative of prior direct experience with CNU Online.

Of the 32 online courses taken, the students' grade experiences covered a broad range, from A to D (there were no F's) and included virtually all other categories such W's and I's. However, when the 32 grades were divided between satisfactory letter grades (A through C) and all others, there were 17 of the former and 15 of the latter. The percentage of satisfactory letter grades was far lower than one might expect to find from online grades generally. The tentative answer to the first question would be that those who had the opportunity to

sign and did so tended to have a more negative experience (or perhaps briefer or more casual experience) of CNU Online than those online students whose names were not found on the petition.

To a great extent being asked to sign the petition may have tapped students' general concern about availability of courses and thus enlisted the signers' consent without requiring much attention to the matter. However, when the occasional student who had some online experience had the opportunity to sign, it probably facilitated his or her tendency to sign if the prior experience had been less than successful.

- Summary report from online telephone counselor, Ms. Ruth Kavanaugh

Ms. Ruth Kavanaugh is a part time employee for CNU Online. Her role has been to contact students who appeared to be having difficulties, finding out the source of their difficulties and offering helpful suggestions. In late September, 1994 she prepared a brief summary report of her findings regarding the online students' experiences.

In brief, Ms. Kavanaugh identified the following main problem areas:

1. Getting started was difficult for many--installing the software; learning the system.

2. Board operations more difficult for Macintosh owners.

3. Downloading and uploading messages is difficult for many.

4. Students worry about missing deadlines and assignments.

Ms. Kavanaugh also identified these positives:

1. Those who had taken previous online courses reported no problems using the system.

2. All reported that they would take other online courses. It is the only way for many to get their degree.

3. All knew that they could call for help.

Many changes in services provided have mitigated these common difficulties that many students experienced. For example, the manual was completely rewritten to be clearer and more user friendly. The level of service and support also increased when a full-time CNU Online administrator was hired in summer 1995.

- Data relevant to a possible "curiosity effect"

At the outset of the CNU Online program in fall 1994 the enrollment patterns were being monitored closely. Since there was no experience with online instruction on which to base reliable predictions, there was a high degree of uncertainty. Contributing to this atmosphere, students who were considering online instruction also often had little experience on which to base their decisions. Therefore they may have been curious, uncertain and tentative.

A retrospective review of data enrollment patterns from the very first days of the program was conducted to test whether the data offer any support for this view. Comparing enrollments in the eight online classes between September 1, 1995 and after the Drop/Add period revealed that the numbers rose from 129 to their final official number of 141. This represented a rise of 9.3 percent. For comparison purposes corresponding classroom sections were selected and the numbers compared for the same period. The net change was a decline of 2.5 percent.

These data were surprising in light of the course persistence data which revealed just the opposite trend: that online students were much more likely to withdraw from the course than their counterparts in the classroom. In retrospect, it now appears that much of the early enrollment rise might have been an expression of curiosity and exploration since many of the late enrollments were "soft" enrollments that later turned into withdrawals. In contrast, the early slight drop in enrollment in the corresponding classroom courses did not turn into precipitous decline.

An educational innovation such as CNU Online attracts attention and therefore some initial "soft" enrollments. However, enrollments must be coupled with reasonably accurate expectations of the time and effort demanded as well as the necessity to be an independent learner and overcome any computer-related handicaps. Students who were unable to make the transition from a more passive mode of learning to CNU Online were fairly assured of having an unsatisfying and short-lived experience.

- Comparative study of academic "rigor"

A random sample of 50 online students provided a basis for testing the comparability of grading online and in comparable classroom courses. These 50 students' records provided overall GPA's and the online grades. From the latter an online GPA for fall 1994 and spring 1995, combined, was calculated.

The plan of this small study was to compare overall grades with online grades, with the student serving as his or her own

"control." That is, comparisons were made between each type of grade for each student. The difference (if any) should reflect the general level of difficulty for the student of maintaining his or her GPA.

The overall GPA was of course influenced by online grades and thus was not a pure measure of grades received by students in traditional classrooms. However, since the number of online courses taken was generally small relative to the entire student record, the overall GPA was used as a convenient and generally accurate estimate of students' grades independent of online. (A small number who had enrolled only in online classes was excluded from this analysis.)

Out of these 50 students, the online GPA's were higher for 22 and lower for 28. However, when the students were further divided according to those whose online and classroom GPA's were quite discrepant (by .50 grade units or more), there were a few surprises. There were 30 such individuals out of the 50; of these 20 did poorly compared to their GPA derived from classroom courses, and 10 did well. There was also a tendency for those who did better online to be better prepared academically as shown by a higher overall GPA.

Overall, these results suggested that there was little difference between online and classroom courses for these students concerning course difficulty as measured by GPA's. There is certainly no support for the idea that online courses lack rigor, in the strict sense of grading difficulty.

However, to the extent that students' online GPA's and GPA's based on classroom courses were discrepant, there were fewer for whom the discrepancy was toward higher grades online. Those who flourished online relative to their own academic records appeared to be better prepared overall academically. This finding also suggested that the online courses possess academic rigor. Those who are not well-prepared academically tend also not to do well in online courses. Indeed, they tend to fall short of their own academic standard of success.

- Pilot Study of a Professional Writing Skills Module

During the spring 1995 semester, Dr. Maureen Archer wrote and conducted the training and evaluation of the Professional Writing Skills Module for CNU Online. This module explains and gives examples for the components of writing and is designed to aid online students in acquiring the essential skills of writing. Dr Archer then conducted a pilot study to assess how well the Professional Writing Skills Module guidelines were understood and how to conduct the evaluations. Dr. Archer worked with several professors, gathered pre- and post-tests, trained an evaluator, and assessed the results.

Since only one class participated in the pilot study, and the Writing Skills Module guidelines were delayed in being forwarded to the students until four weeks into a short 7.5 week term, the pilot study did not provide an adequate test of the effectiveness of this module for the online format. Nevertheless, some of the procedures were tested, and on the basis of this experience plans were made for a test in the fall semester. At this date these plans are on track, professional graders have been hired, and there are strong indications that the test will be much more satisfactory.

Concluding Remarks

The supplementary assessment activities provided further evidence that essentially corroborated points made earlier in this report. These data are consistent with the view that courses taught online are becoming a more established alternative form of instructional delivery at Christopher Newport University. Students who enrolled in these courses and were unprepared or underprepared, or merely curious, found the experience intense and difficult. The first part of the course was crucial because, due to the intensity of the course, it was easy to fall behind and difficult to catch up again. Online courses were generally as or more rigorous in their expectations than classroom courses. However, the course expectations could differ in important ways from classroom courses. They reinforced independent learning, or encouraged those who were less independent to become more so. They also offered the potential for transportable modular presentations such as the Professional Writing Skills Module to challenge ways of thinking about courses as compartmentalized, self-contained units.

The potential of online instruction, however, calls for renewed efforts to adequately prepare and inform students and others. Even with such efforts, "soft" enrollments--i.e., enrollments of students who have an inadequate preparation or have unrealistic expectations--probably will continue to be a factor as they were one year ago. An initial unsatisfactory experience can predispose students toward taking a position publicly which is (by implication) critical of online education. On the other hand, successful experiences predisposed students to persevere with online instruction. These findings suggested the importance of disseminating accurate and realistic information about online instruction. Students need to be better prepared to chart their educational careers with the online alternative firmly and realistically in mind.

Finally, this report can be viewed as evidence for assessing the adequacy of the online assessment process itself. The online assessment process was collegial from the outset. The CNU Online Assessment Plan was written in a collaborative effort involving

the Director of Assessment and Evaluation and Professors Miller, Williams, and Teschner. Modifications and adaptations were made during 1994-95; however, this report documents that a reasonable attempt was made to follow the guidelines of the plan and carry out a "phased implementation" as called for by the plan. The report also documents where some of the problem areas were and suggests the outlines of the next revision, called for by December 15, 1995. These areas include at least: 1) more high quality comparative data on course-specific student learning; 2) more data on measures of general knowledge and skill development through online instruction.

Expansion of the scope of assessment studies also would be highly desirable. Issues that need further study include: 1) effective teaching strategies by discipline; 2) outcomes uniquely or primarily associated with a digital as opposed to a classroom environment; 3) comparative general education information; 4) other issues as they arise. However, such expansion will depend upon the availability of funds and a realistic analysis of work load requirements, data access/processing requirements, and staff support. Any revision of the CNU Online Assessment Report needs to balance what would be desirable against what is currently possible or reasonable given resource and staff limitations.

THE 1995 ASSESSMENT REPORT ON CNU ONLINE

APPENDICES

Dennis R. Ridley, Ph.D
Director of Assessment & Evaluation

Buck G. Miller
Director of Public Administration

C. Harvey Williams, Jr.
Chair, Department of Government and Public Affairs

Christopher Newport University
October, 1995

APPENDIX MATERIALS

1. 1995 DEGREE RECIPIENTS WHO HAD TAKEN AND PASSED AT LEAST ONE CNU ONLINE COURSE DURING 1994-95

2. A REPORT ON CNU ONLINE COURSE PERSISTENCE, 1994-1995

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APPENDIX 1

1995 DEGREE RECIPIENTS WHO HAD TAKEN AND PASSED AT LEAST ONE CNU ONLINE COURSE DURING 1994-95

The following table provides the breakdown of 32 May 1995 degree recipients, who had taken and passed courses online, by degree, major and concentration (if applicable).

DEGREE	MAJOR	CONCENTRATIONS	NUMBER
BSGA	GOVERNMENTAL ADMINISTRATION	CRIMINAL JUSTICE LEGAL STUDIES PUBLIC MANAGMENT TOTAL:	9 3 2 14
BSBA	BUSINESS ADMINISTRATION	MANAGEMENT MGMT/REAL EST. MGMT INFO SYST FINANCE TOTAL:	2 2 1 1 6
BA	HIST(2)/PHIL(1)/ SOC WK (1)/ POL SCI(1)	N/A	5
BS	CPSC(3) PSYC(2) BIOL(1)	N/A	6
BSIS	INFORMATION SCIENCE	N/A	1

APPENDIX 2

A REPORT ON CNU ONLINE COURSE PERSISTENCE, 1994-1995

This study was intended to measure the persistence of enrollees in the various online courses and their classroom counterparts. A note to report scanners: Your review of this report will be aided by reading the bolded portions below.

Final grade rosters were the primary source of data for the analysis. These rosters contain the letter grades (A-F) plus the other enrollment statuses and outcomes, including W, P, I, AU, and *, brief explanations of which are as follows:

W = Withdrawal prior to the last announced date allowed for withdrawal without grade penalty
P = Pass, for students exercising a pass-fail option
I = Incomplete (requiring completion during the next semester)
AU= Audit, or enrollment not for credit

Methods

For purposes of this study, persistence (Ps) is defined as the percent of those students who are enrolled in a course (or courses) pursuing credit who actually finish the course(s) and receive grades (A-F or P). Audits are not included in the base because they are not enrolled for credit. Incompletes also are not included because their pursuit of a grade has been deferred to the following semester. Non-completion is also termed the withdrawal (WD) rate and is simply 100 - Ps.

From the above definitions, if TOTAL is the number of enrollment classification categories for a given course, the withdrawal rate, WD, is found by this formula (persistence again is 100 minus WD.):

WD = W/(TOTAL - AU - I) * 100

The comparable statistics also can be calculated for categories of courses when the number is greater than one, such as all classroom courses of a given course number, all courses in a given discipline, all courses in a division of the University or, finally, all courses at the University. The formula for a category of n cases would be:

WD = SUM (W)/[SUM TOTAL - SUM AU - SUM I] * 100, where sum is from 1 to n. This formula in effect averages WD over all cases in the category.

At this writing two semesters (94-95) of the CNU On-line experience have been completed, and thus this study focuses on

the online courses which have been taught during this time. Various relevant comparisons will be made below to render these results more meaningful.

Fall, 1994 On-Line Course Persistence

The following table summarizes the results found thus far by course. The table also provides one bottom-line statistic which is a composite for all (wholly) online classes taught in fall, 1994. The reader should be cautioned that a statistic is not very meaningful for small enrollments (10 or less).

COURSE	ENROLLMENT (CREDIT)	WD	Ps
ENGL 101 - 70	6	0	100
ENGL 207G- 70	9	22	78
GOVT 201 - 70	11	9	91
GOVT 371 - 70	8	25	75
GOVT 451 - 70	10	40	60
PHIL 201G- 70	40	23	77
PHIL 202G- 70	23	44	56
SPAN 101 - 70	28	39	61
COMPOSITE	135	30	70

These results suggest a rather high rate of withdrawal (or low persistence) during fall, 1994. However, comparisons are needed to provide context.

English: The numbers enrolled in the online English courses may be regarded as too small to be very meaningful. For comparison, English 101 (classroom) courses in fall, 1994 revealed a 5.9 percent WD rate. English 207G (classroom) courses showed an 7.3 percent WD rate. The entire English discipline curriculum revealed a withdrawal rate of 8.0 percent. (Discipline or larger aggregates contain classroom courses, but since the percent was small, no attempt was made to remove the online contribution to the overall numbers.)

Government: The WD rates for the online government courses ranged from 9 to 40 percent. Again the comparison courses taught in the classroom had generally lower withdrawal rates. Two GOVT 201 courses showed a combined 8.8 percent WD rate--not different from the 9.1 percent for the online courses. However, two GOVT 371 courses had a 7.4 percent rate as compared to 25.0 percent

online. Finally, one classroom-taught GOVT 451 course revealed a WD rate of only 5.1 percent compared to 40 percent online. The entire Government discipline curriculum had a WD rate of only 8.6 percent compared to an online aggregate of 24.1 percent.

Philosophy: The two philosophy courses had WD rates of 22.5 and 43.5 percent. Five PHIL 201G courses were taught in the classroom during fall, 1994, having a combined WD rate of 7.3 percent9.6, approximately one-third the online rate. Only one 202G course was taught in the classroom, and its WD rate was only 2.6 percent. The fall, 1994 Philosophy discipline offerings had a WD rate of just 9.3 percent.

Spanish: The single online Spanish 101 course, with a WD rate of 39.3 percent, was much higher in that statistic than the combined number for the 22 classroom Spanish 101 courses which were offered in fall, 1994. That combined number was 19.1 percent, slightly higher than the department's rate of 16.1 percent.

For even broader context, the curriculum offerings of the Division of Arts and Humanities for fall, 1994 had a WD rate of 9.7 percent. The corresponding number for the Division of Social Science and Professional Studies was just 6.6 percent. (Business courses had not been offered online in fall, 1995; thus that comparison is not relevant.) Finally, the University wide WD rate of 9.8 percent should be cited.

SUMMARIZING: During the fall of 1994, the first semester in which the CNU Online program was in operation, the persistence of students who enrolled for credit was substantially LESS than that of students who enrolled in comparable classroom courses. The WD rate for the online courses as a whole was much greater than the University-wide trend--in excess of three times that rate.

Spring, 1995 On-Line Course Persistence

The following table summarizes the results found for the Spring semester by course. The table also provides one bottom-line statistic which is a composite for all (wholly) online classes taught in fall, 1994.

COURSE	ENROLLMENT (CREDIT)	WD	Ps
ENGL 102 - 70	30	41	59
ENGL 208G- 70	25	14	86
GOVT 201 - 70	23	45	55

GOVT 202 - 72	35	20	80
GOVT 331 - 72	36	19	81
GOVT 355 - 70	39	33	67
GOVT 358 - 71	27	20	80
PHIL 201G- 71	46	24	76
PHIL 202G- 72	62	17	83
PHIL 395P- 70	7	25	75
SOCL 201G- 70	16	25	75
SPAN 102 - 70	26	23	77
COMPOSITE	372	25	75

These results again show a high rate of withdrawal (or low persistence), but these numbers are improved by approximately 5 percent. One administrator looked for improvement on the basis of better organization in the spring; and indeed, there was a small improvement. Again, comparisons by course and discipline are useful.

English: ENGL102-70 had a WD rate of 40.7 percent as compared to 8.6 percent for the classroom version of ENGL102. The WD rate of ENGL208G-70 was 13.5 percent; in comparison, the WD rate for the other two ENGL208G courses was 7.8 percent. The entire English discipline curriculum had a withdrawal rate of only 8.7 percent.

Government: There were five GOVT courses offered wholly online in spring, 1995. For every one of the five comparable classroom courses, the class offered under that designation had a lower WD rate than the online version of the course. The composite comparison for GOVT was: a WD rate of 24.1 percent for the online courses compared with only 7.7 percent for the comparable classroom courses. The GOVT discipline as a whole had a WD rate of just 10.1 percent.

Philosophy: Enrollment in PHIL395 was extremely small and will not be separately considered. PHIL 201G-71 and 202G-72 both had higher WD rates than the comparable classes under each designation taught in the classroom. The composite online rate of withdrawals was 20.4 percent as compared with the combined rate for the equivalent classroom courses of only 5.1 percent. The PHIL discipline WD rate was only 8.7 percent.

Sociology: SOCL201G-70 had a WD rate of 25.0 percent compared with only 4.1 percent for the two other SOCL201G

classes. The SOCL discipline WD rate was just 7.6 percent.

Spanish: SPAN102-70 had a WD rate of 23.1 percent compared with 12.6 percent for classroom-based SPAN102 courses. The WD rate for Modern Languages was 9.9 percent.

For broader context, the curriculum offerings of the Division of Arts and Humanities for spring, 1995 had a WD rate of 8.5 percent. The corresponding number for the Division of Social Science and Professional Studies was just 6.6 percent. (Still no Business courses been offered online in spring, 1995.) Finally, the University wide WD rate of 8.4 percent should be cited.

SUMMARIZING: During the spring of 1995, the second semester of the CNU Online program, the persistence of students who enrolled for credit was still substantially lower than that of students who enrolled in comparable classroom-based courses. The WD rate for the online courses as a whole was much greater than the University-wide trend--still slightly more than three times that rate. However, there was a slight improvement in the rate from fall to spring--from 30 to 25 percent.

APPENDIX 3: MEMORANDUM ON COURSE PERSISTENCE

TO: Provost, Executive Assistant to the President, BACUP, Self-Study Steering Committee, Student Assessment Committee, Academic Deans, CNU On-Line staff and teachers
FROM: Dennis R. Ridley
Director of Assessment and Evaluation
RE: Course Persistence, Online vs. Offline
DATE: August 4, 1995

I have been encouraged to make the findings on this issue widely available. However, rather than sending out another report like the last one (a revised version of which has been completed and is available), I will summarize the results along with some related points. Finally, I will offer an interpretation of what is going on to produce these results.

I trust that most will find this updated report stimulating, but please remember that it is only preliminary. **The reader is also encouraged to remember that the measure of persistence is only one among a number of measures that make up assessment of online instruction.**

Summary of findings related to persistence

1. There was a relatively a high rate of withdrawal (or low persistence), in online classes, averaging between 25 and 30 percent in the fall and spring semesters. The rate improved by approximately 5 percent from fall to spring, but remained about three times the University average. Comparable courses taught in the classroom generally had a much lower withdrawal rate as well.

2. The phenomenon does not in any obvious way visit particular instructors or disciplines more than others; it is a general phenomenon of online instruction.

3. Persisters in online courses (those who remain and receive a grade) compared to persisters in other courses were not generally the better or more successful students overall. However, persisters in online courses (excluding failures) averaged consistently higher gradewise than their counterparts (classroom course persisters sans failures) in the comparable courses. This finding was fairly consistent across courses.

4. Among persisters, the rate of failures was also consistently higher in the online courses than in the counterpart classroom courses.

5. Course success (defined as persisting and passing) was examined in two spring online courses where some took the

prerequisite course online and others offline. This comparison showed significantly (statistically) better success for those who had the online experience for the prerequisite or first course in the sequence.

6. Withdrawals from online courses were more likely to occur when the student already has a "full plate", i.e., 15 or more credits. (In that situation a withdrawal from a 3 credit course did not involve a monetary loss since more than 12 credits can be taken for the same tuition.) However, what is suspected (but untested as yet) is that overload is not as strong as a determiner of withdrawals from the classroom courses.

7. Instructor Evaluation Survey results comparing online and classroom courses are available and are generally comparable (that is a subject for a different memorandum). One particular question which online students tend to agree with more highly than their classroom counterparts is, "The subject matter of this course is difficult."

Interpretation of online persistence

Students who persist in online courses are generally satisfied and find the experience of comparable value to their learning in the classroom environment. However, they also find the experience to be intensive and demanding. They are called upon to be in frequent online communication with the instructor and their peers. They find the subject matter with which they must deal to be at least as difficult, or more difficult, than their counterparts in classrooms. Most students find out quickly that in this type of instructional milieu they cannot get by if they let their work slide. They cannot hope to make up for absence from the task by three or four major cram sessions during the course. Moreover, a student who falls behind the pace quickly becomes obvious to both the instructor and other students. The problems of pace and demand also are exacerbated for students who are new to CNU On-Line since they need to become familiarized very quickly with the system and solve any technical problems. Those who have had online experience have an advantage and tend to perform better.

The money students have invested in a course is generally an important, un-wastable commodity. Since most students stand to lose that investment by withdrawing, they will try to remain to the end. However, there is a category of students who do not stand to lose by withdrawing, namely, those who enrolled for say, 15-18 credits. Such students could very easily adopt a strategy which says, "Enroll in more courses than you would ordinarily be able to handle. If you can handle it, great; if you have to drop a course, also great; there is no loss." Such students spend the first part of the semester looking over their course schedule to determine which, if any, they will have to drop. If they are new

to CNU On-Line, they will find the experience sufficiently different and demanding that the course will become a prime candidate for dropping. Their offline counterparts might have the same strategy. However, they will more likely persist in their course since it will not become clear as quickly whether they can make it through.

Students who persisted in and passed an online course have had to learn not only course material but also the (for many) novel rules of participation. As time proceeds, more students will become repeaters and will not have to relearn the rules. Also, as CNU On-Line becomes better organized to assist new students, more students should find a smoother path of adjustment to the system. Perhaps some of the modest improvement in course persistence from fall to spring was due to such improvements. However, because the experience is so intense those who do not make quick adjustment, if they do not withdraw, will fall behind even faster than they would in the classroom. There at least they know the rules. The resulting high failure rate can be a problem.

APPENDIX 4: ONLINE COURSE PERSISTENCE FOLLOW-UP STUDY: THE "MIGRATION" HYPOTHESIS

The higher withdrawal rate among online than traditional classroom students suggested another possible explanation. When students exercised the option to withdraw, a certain number might have done so to avoid an unsatisfactory outcome such as a D, F or the change to an audit (AU) in lieu of credit. In effect, the higher online withdrawal rate might be explained as migration of students from one type of unsatisfactory category (i.e., D's) to another (W's). This possibility would suggest that when these other grade categories are added to the W category, the resulting percent of all enrollments would be much closer to equal for online and classroom students. Thus, overall "unsatisfactory quotients" were found by dividing the course enrollments by the various low- or non-grade categories for the course combined. ["P" (for Passing) was excluded because it is a satisfactory outcome; "I" (Incomplete) was also excluded because it is deferral of a grade effort until a later time.] The quotient was thus the percent of total enrollments in a class, or group of classes, in which the outcome was less satisfactory than an A through C grade.

For the fall '94 and spring '95 semesters these quotients were found for each online class and for the same classroom section or sections (combined). The differences (in percent of "unsatisfactory" grades) between the online courses and their classroom equivalents were also found. In order to arrive at a composite number for an entire semester, weighted averages were found. The purpose of this procedure was assure that the contribution of a deviation to the summary statistic for the semester was in direct proportion to the size of the online class. Thus a Philosophy topics class, for example, would have a small weight and the heavily enrolled Philosophy 201G (a liberal studies distribution course) would have a much larger weight applied to its deviation score. The result for the fall was a deviation of approximately 17 percentage points. Thus, on average the online classes were considerably higher than their classroom comparisons in the "unsatisfactory" measure. The corresponding result for the spring was about 9 percent. Thus, the results for the two semesters were not close together on this composite statistic. (However, the manner in which they differed is revealing as will be discussed below.)

For this result to be more meaningful, it had to be compared with the overall withdrawal rate deviation, calculated in the parallel way. The withdrawal rates for each course (classroom or online) or group of classroom courses were found practically as they had been before. One inconsequential difference was that audits were added to the denominator so that the withdrawal and "unsatisfactory" measures would be exactly comparable. The

weighted average withdrawal deviations were found for both fall '94 and spring '95. For the fall that average was approximately 12 percentage points. This reveals that online students tended to withdraw more frequently by this measure of percentage difference. Similarly, the parallel finding for spring was approximately 11 percentage points. These two results are consistent.

Comparison between the mean withdrawal and "unsatisfactory" deviations (between online and classroom) was suggestive. It suggested that the elevation of one "unsatisfactory" outcome (withdrawal) for online courses was <u>not</u> generally compensated for by the elevation of other indicators for the equivalent courses offered in the classroom. While the results were fairly dissimilar between the two semesters. However, both results were difficult to reconcile with a hypothesis that withdrawal was largely due to migration toward withdrawals from anticipated less satisfactory outcomes.

Some further insight into this result was provided by identifying the contribution of each type of outcome (D, F, AU and W) to the results. These contributions are best thought of as components which add up to the totals given above. Again, the totals are summary statistics representing the overall difference between online and comparable classroom courses. These results are summarized in the following table:

GRADE OUTCOMES	FALL '94 DIFFERENCE VALUE	SPRING '95 DIFFERENCE VALUE	COMMENTS
D-RATE COMPONENT	.06	-4.35	D's were fewer online in most classes. The fall value is positive only because of a huge contribution of one course.
F-RATE COMPONENT	4.02	1.92	F's were higher online in most classes both terms; less so in the spring
AU-RATE COMPONENT	1.05	0.42	AU's tended to be higher online but made only a small difference
W-RATE COMPONENT	12.22	10.89	The difference (online vs. classroom) was consistent
"UNSATISFACTORY" INDEX (ONLINE/CLASSROOM DIFFERENCE) (D+F+AU+W)/TOTAL	17.35	8.88	Note that the components above add up to these summary statistics.

Discussion and Conclusions

The table above contradicts the proposed hypothesis as a general phenomenon. Students did not generally exercise the withdrawal option based on their anticipation of a worse outcome if they did not. In particular, the consistent appearance of more F's in the records of online enrollees is at variance with this suggestion. In essence, higher withdrawals from online courses account for the largest single part of the constructed "unsatisfactory" difference index. Indeed, their contribution is larger than the overall "unsatisfactory" difference rate in the spring '95 semester. In view of the consistently smaller number of D's in the online classes, there is limited support for the suggestion that some students who anticipated receiving less than a C withdrew from the course.

APPENDIX 5

LINKING COURSE PERSISTENCE AND ONLINE PERSISTENCE

This small study examined the individuals who had withdrawn from one or more cnu online classes in fall '94. The purpose was to examine whether they followed up in later semesters with enrollments in the classes they dropped. Did they take the class online, or in the classroom, given the choice? This study attempted to determine whether the withdrawals were mostly related to the course, the method of delivery, or extraneous factors.

The availability of courses, both online and classroom, was germane to this study. Since some of the courses were offered alternate semesters, it was necessary to expand the scope of the inquiry to a third semester (fall '95) so that a more complete cycle of course offerings, both online and classroom, was available to the students.

For the purposes of this study, student records were examined for a total of 34 students who had withdrawn from at least one course. Thirty of the 34 had withdrawn from 1 course and 4 had withdrawn from 2 courses. In the interests of clarity, the 4 with two withdrawals will be discussed in a separate small section. This will permit presentation for the majority (i.e., 30) to follow and classify the outcomes of a single course per student.

After examining the records of the 30 students, the following categories were devised to cover (with minor discrepancies) all of the cases:

I. Dropping/stopping out: Since withdrawing from the online course (and perhaps other courses), the students' records revealed no further enrollments at the University. None had graduated.

II. Follow-up enrollment in an equivalent online class: The student enrolled in an <u>online</u> class in one of the two following semesters.

III. Follow-up enrollment in an equivalent classroom course: The student enrolled in an <u>classroom</u> section in one of the two following semesters.

IV. No record of any follow-up enrollments: Although the student ostensibly remained enrolled at the University, there is no evidence that he or she attempted to take the same course again, either online or in the classroom.

CATEGORY	FREQUENCY	COMMENTS
I. DROP/STOP OUT	9	A case or two of suspension may be included.
II. ENROLLMENT ONLINE	2	One A; the second is ongoing.
III. ENROLLMENT IN THE CLASSROOM	9	(2 enrolled in languages other than Spanish)
IV. NO COURSE ENROLLMENT	10	Enrolled in other classes.

Regarding the four cases of withdrawals from two online courses, the same categories could be applied. Two could be classified as dropping or stopping out; one had no record of enrollment, and the fourth enrolled in both courses online again during the following semester (but failed both).

Discussion and Conclusion

The data presented above strongly suggested that students who withdrew from an online course, at least in fall '94, were not inclined to re-enroll in the same course online. The other outcomes were about equally divided among dropping or stopping out, deferring the issue of enrolling in the course, or actually enrolling in the same or equivalent course for credit in a classroom.

The low number who elected to re-take the course compared to those who took the course in the classroom suggested that students who withdrew tended to have problems with the method of course delivery more than with the course per se. Since the course from which the student withdrew always was offered online during the two-semester follow-up period, the opportunity was generally available for students. With online courses, work or other schedules cannot have been the issue.

These findings underscore the importance of helping students to be prepared and to know what to expect from an online class. There appears to be an initial period of adjustment to online for students like these who had never taken an online class before. If they were not properly prepared, they were in for a rude awakening. Under those circumstances there is a strong likelihood that those students will stay away from online classes ever afterwards.

Another possibility is that the novelty of CNU Online interacted with a student's preparedness for online instruction.

Like any educational innovation, CNU Online has had and will have its strong detractors. Students who had an initial difficulty with an online course might have proved quite open to these negative judgments. Such evaluations possibly provided a convenient "story line" to account for their experiences. If so, one might predict that as CNU Online becomes even more established as a viable alternative for students, there will be less tendency for students to stay away from online courses after one brief encounter. In addition to the increasing numbers of multiple enrollments by students, a decreasing number of brief, casual encounters with online instruction could be a mark of increasing program stability in the future.

Follow-up interviews with as many of these students as possible would go a long way towards testing the conclusions of this section.

APPENDIX 6

CNU INSTRUCTION EVALUATION SURVEY MEAN RESPONSES
ONLINE AND CLASSROOM STUDENTS,
FALL 1994, SPRING 1995, AND SUMMER 1995

Item response scale: "Strongly Agree" = 5; "Agree" = 4; "Neutral" = 3; "Disagree" = 2; "Strongly Disagree" = 1.

	QUESTION	CLASSROOM Spring 1995	ONLINE Spring 1995	ONLINE Fall 1994/ Spring '95 Summer '95
1.	The course the instructor presented was consistent with the course description in the Catalogue.	4.59	4.25	4.31
2.	The instructor came to class well-prepared. (The instructor's messages showed evidence of careful thought and preparation.)	4.65	4.32	4.45
3.	The instructor's grading policies were clearly explained early in the term.	4.52	4.22	4.24
4.	The instructor's grading procedures were fair.	4.41	4.17	4.26
5.	Graded assignments and tests were returned in a timely fashion.	4.53	4.22	4.25
6.	Tests covered knowledge, application, or reasoning that could be expected on the basis of course content.	4.35	4.21	4.23
7.	The instructor maintained regular office hours and encouraged students to seek help when needed. (The instructor encouraged students to seek help when needed and was readily accessible when he or she did so.)	4.33	4.35	4.40

8.	The instructor demonstrated command of the subject matter of the course.	4.63	4.55	4.61
9.	The instructor's presentation of the course material was clear and understandable. (The instructor's messages to me and to the class made the course material clear and understandable.)	4.25	4.10	4.04
10.	The instructor demonstrated interest and enthusiasm for the subject matter.	4.61	4.40	4.52
11.	The instructor was intellectually motivating and stimulated learning.	4.23	4.10	4.25
12.	The instructor met classes on time and for adequate duration. (The instructor consistently devoted the time necessary to make this course a valuable learning experience for me.)	4.72	4.14	4.19
13.	I found this professor to be an effective teacher in this course.	4.34	4.26	4.33
14.	The subject matter of this course is difficult.	3.49	3.80	3.84
15.	The subject matter of this course is interesting.	3.97	3.86	3.94
16.	The subject matter of this course is a valuable part of my education.	4.01	3.72	3.64

ADDITIONAL QUESTIONS UNIQUELY FOR ONLINE STUDENTS, Fall 1994, Spring 1995, and Summer 1995 (Questions 17-33) (Item response scale same as above.)

17.	The course developed my problem solving skills.	3.44
18.	The course enabled me to draw reasonable inferences from observations.	3.91

19. The course developed my ability to integrate and synthesize information.	3.97
20. The course developed my ability to use facts to support opinion.	3.93
21. The course developed my ability to appreciate the historical development of the subject matter addressed in the course.	3.81
22. The course developed my tolerance for other viewpoints.	3.85
23. The course developed my ability to work productively with others.	3.64
24. The course developed my ability to resolve controversies.	3.50
25. The course helped me learn the vocabulary and concepts of the subject.	4.11
26. The course helped me learn the objectives and values of the subject.	4.10
27. The course developed my reading skills.	3.68
28. The course developed my writing skills.	4.06
29. The course developed my telecommunication skills.	4.17
30. The course developed my computer software skills.	4.03
31. It is more convenient for me to take this course online than in the classroom.	4.19
32. Online courses are necessary for me to complete an undergraduate degree.	4.02
33. Cost is a factor (scheduling, travel, etc.) in taking online courses.	3.67

APPENDIX 7

ONLINE FACULTY QUESTIONNAIRE MEANS AND ANALYSIS--SUMMER 1995

Online faculty satisfaction levels with student performance and learning (5-point scale used where Higher = 5 and Lower = 1)	Mean Response
1. How do you rate the performance of cooperative learning groups online with classroom group work?	4.0
2. How do you rate the development of student writing skills online in comparison to comparable classroom courses?	4.3
3. How do you rate the development of student independent reading comprehension skills online in comparison to comparable classroom courses?	4.1
4. How do you rate student learning levels of basic course vocabulary and concepts online in comparison to comparable classroom courses?	3.8
5. How do you rate the development of student problem solving skills online in comparison to comparable classroom courses?	4.4
6. How do you rate the development of student integration and synthesis of information skills online in comparison to comparable classroom courses?	4.2
7. How do you rate the level of student tolerance for other viewpoints online in comparison to comparable classroom courses?	4.0
8. Overall, do you believe online students participate more or less in course discussion than in comparable classroom courses?	5.0
9. Overall, do you believe students learn more or less course subject matter online than in comparable classroom courses?	4.3
10. How do you rate the quality of student-to-faculty interaction online in comparison to comparable classroom courses?	3.7
11. How do you rate your satisfaction with the online medium?	3.6

Assessment plan implementation

The measures for determining level of implementation of the assessment plan are: pre-test and post-test as measures of learning outcomes, incorporation of critical thinking skills, use of cooperative learning among peers, techniques of data retrieval and analysis, and participatory interaction.

12. As a designer of an online course, I found it useful to use pre-test and post-test modules or units in order to measure

learning outcomes of students. 2.0

13. As a designer of an online course, I created a course that taught students skills of comprehension, analysis, synthesis, application, and evaluation of the subject matter. 4.3

14. As a designer of an online course, I used student work groups to create learning environments where students learned to negotiate differences among themselves while creating group work products. 4.3

15. As a designer of an online course, I instructed students how to retrieve, analyze, and interpret data using computer-managed resources. 3.5

16. As a designer of an online course, I managed the development of a message log in which student messages were characterized by contextual coherence, thematic development, convergent and divergent thinking, conceptual analysis, and civility and tolerance. 4.2

Faculty Training

The following are measures of the results of faculty training for online teaching: participant interactivity, informal/formal message distinction, formal/informal message quality, uploading/downloading techniques, offline mail reader procedures, and techniques for work group procedures.

17. As an online faculty member, I was made aware of how to organize subject matter material to enhance interactivity between participants. 3.9

18. As an online faculty member, I was introduced to the distinction between informal and formal messages. 4.1

19. As an online faculty member, I was made aware of criteria for measuring the quality of informal and formal messages. 3.9

20. As an online faculty member, I was made aware of how to upload and download messages from a word processor to CNU ONLINE. 3.8

21. As an online faculty member, I was introduced to how to use a mail reader to download many messages at one time; answer the messages offline; and then upload them in one operation. 3.4

22. As an online faculty member, I was introduced to how to organize students into groups for purposes of constructing group work products online. 3.7

Online Faculty Questionnaire Analysis (by Professors Williams and Miller)

Out of 17 online instructors during summer 1995, 17 returned the questionnaire. Two questionnaires were not fully completed.

The first eleven questions concentrated upon online faculty satisfaction levels with student performance and learning. The mean for these questions is 4.1 on a scale of 1 (lower than classroom performance) to 5 (higher than classroom performance). Online instructors rate online student performance and learning substantially higher than classroom outcomes. Every mean was in the four to five range with the exception of student learning levels of basic course vocabulary and concepts. However, even the mean for this question (3.8) was above that of the classroom.

The second part of the questionnaire (questions 12-16) focused on the implementation of the online assessment plan. The overall mean for these five questions is 3.7. The only question to fall into the two range (2.0) was, "As a designer of an online course, I found it useful to use pre-test and post-test modules or units in order to measure learning outcomes of students." It is clear that the pre/post test phase of the assessment plan needs revision in FY96. Removing this question from the equation, the mean for the remaining four questions is 4.1. Instructor satisfaction with the online assessment process was positive.

The third section of the questionnaire concentrated upon faculty training for online teaching. The overall mean for these six questions was 3.8. Again, instructors were positive about the training process. However, five of the questions fell into the three range, which suggests that the online program in FY96 must concentrate more of its efforts into faculty training.

APPENDIX 8: MEMORANDUM RE PRE- AND POSTTESTING ONLINE

TO: Provost Powell
FROM: Dennis Ridley and James Husband
RE: Pre- and posttesting online
DATE: August 8, 1995

Pre- and posttesting of online course material was tried during spring 1995 and also during the past summer. While the experience so far has been limited, both the data available for our inspection (spring, 1995) and the experience of this testing--from the standpoint of students and administrators alike--leads us to collaborate in making the following conclusions and recommendations.

1. The major difficulty lies in student motivation. The task is ungraded and there is evidence that a number of students, particularly on the posttest, are not taking the task seriously. Zero percent correct on a posttest, for example, or other evidence of random responding, strongly indicate that student motivation is a problem. In some cases posttest results are poorer than pretest results. There was other evidence suggesting that the task students and faculty are being asked to support lacks face validity and does not fit well with the course experience. Rather than conclude that students are learning nothing, it is far easier to argue that lack of student effort is the source of the problem and that the data are largely invalid.

2. Dr. Edward Smith who, as you know, recently conducted an "assessment of assessment" at CNU, recommended deleting the pretests. He pointed out that this change would reduce the workload and allow us to double the number of questions on the posttests and thereby increase their reliability. Furthermore, he found no compelling reason for using pretests since "the pertinent comparison is between the posttest scores for on-line vs. traditional sections." Our experience leads us to support Dr. Smith's recommendation.

3. Accordingly, we recommend that assessment testing be limited to course posttests, and that by spring semester of 1995 such tests be embedded in the course and be graded. We suggest that this change will ultimately become easier to administer, will enjoy greater faculty and student support, and will provide more valid assessment data. Details regarding test development, test content and the mechanics of test administration would remain to be worked out. We believe faculty should have wide latitude in regard to test content and format (e.g. essay vs. objective) as long as there existed credible external checks on the results.

4. In the short term (for fall, 1995), we recommend that assessment testing should be limited to course posttesting but that the tests remain ungraded. As recommended by Dr. Smith, we support requiring longer and thus more valid posttests (about 25 multiple choice items). Jim has already approached several adjunct faculty members and received their consent to pilot test graded, embedded assessment testing.

5. Finally, the credibility of the CNU Online program rests heavily on the demonstration of comparable learning online and in equivalent classroom courses. We urge that comparable testing of classroom sections should be made the rule rather than the exception. Jim has obtained tentative approval of several faculty members who are teaching comparable online and classroom sections to use identical posttest questions in the comparison classes using the embedded method. In addition, deans and department chairs need to become involved in order to facilitate these procedures. While some of these types of data have been collected, we need to strengthen the returns.

We look forward to discussing these ideas with you on Thursday at 10:00 a.m.

APPENDIX 9

ONLINE/CLASSROOM TEST COMPARISONS

The 1995 CNU Online Assessment Plan called for each instructor to develop test items for use in an online format. Pre-testing as well as post-testing was planned and was, in most cases, conducted. It is necessary to review that experience to account for the uses of testing for online/classroom comparisons. That experience was instructive and informative. However, one of the consequences of using pre- and post-testing with no grade associated with performance on these tests was a arguably a negative effect on the uses of tests for comparative purposes. Other circumstances, such as the approval of the Assessment Plan only days prior to the start of the spring semester, 1995, accounted for some confusion in the implementation of the plan. These circumstances also did not assist the effective use of tests for comparative purposes.

The Assessment Plan called upon each online instructor to collaborate with a colleague who was teaching a classroom section of the same-numbered course. The two were required to agree on a core content, i.e., important concepts and terms that should be learned in the course. They were then required to agree on a set of questions that would be amenable to testing both online and in the classroom. (Of course, if the online instructor was also teaching the same course in the classroom the requirement could be met without involving another colleague.) However, due to the circumstances alluded to above, just four cases were found which minimally met this requirement. Because of varying circumstances, each case will be discussed separately.

Case No. 1. This professor used both pre- and post-testing through two units of his course which he taught both online and in the classroom. Since pre- and posttests were not graded and were understood as such by students, it is probable that student motivation was low. In Case No. 1, this interpretation would apply to both the online and classroom sections since the instructor, in the interest of consistency, used the same (ungraded) procedure for both classes. The evidence also indicates low motivation. For instance, a number of scores at or near zero on posttests strongly suggested random responding by a number of students. At the same time, other students received scores of 80 percent or higher. The mean scores, both online and standard courses, were between 31 and 44 percent. Online and classroom scores did not differ significantly from each other in a statistical sense.

Case No. 2. This professor used the same unit tests in both online and classroom versions of the same course. The unit tests were averaged and the average grade was given substantial weight in determining grades. We may assume that student motivation was optimized by the knowledge that performance on the tests counted in the grade. Indeed, mean performance was over 70 percent--much higher than in Case No. 1. Although the online class consistently averaged higher than the classroom students, the difference was not statistically significant.

Case No. 3. The professor was not able to implement comparative objective testing due to circumstances of late book arrivals and the necessity

of assigning different course material. However, the professor made use of some of the same essay questions on his final exams in the two courses. At the request of the Director of Assessment and Evaluation, he later addressed the issue of the comparability of the two sets of performances in a memorandum. He found that "...the work of the online students was at least as good, and I think better, than that of students in the traditional classroom." Further, he commented that the online students were forced out of a passive mode and "...they were by the end ready and able to make arguments in a critical way. I think their critical thinking skills were higher than the class average for the classroom section.

Case No. 4. The professor used the same test and publisher's test item bank as his colleague for the same introductory sociology course. The chapters and topics covered were quite similar. The colleague gave his students a final that was not comprehensive while the professor gave his students a comprehensive final from the same data bank source. While the colleague's students' test scores averaged somewhat higher, the difference was not statistically significantly. Assuming that the items averaged the same difficulty, and the online professor's test was more challenging because it was comprehensive, the test performances of the two groups therefore were quite comparable. Moreover, the two groups received the same pre-test early in the course, the data of which suggested that the two classes started at a similar level of sophistication.

The above four cases provide evidence which, though limited, supports the conclusion that when students in comparable classroom sections are tested using the same or similar tests and procedures, the online students perform comparably. There is some evidence (from Case No. 3) that the performance is superior when the test format calls for writing and a critical response.

APPENDIX 10

CNU ONLINE STUDY OF PREREQUISITES, FALL TO SPRING 1994-95

This study examined the question of how students performed in spring courses for which the prerequisites could be taken in the fall either online or in a traditional classroom setting. There were three courses offered in the fall in both modes which were prerequisite to courses offered in the spring: English 101, English 207G and Spanish 101. The corresponding courses offered in the spring were English 102, English 208G (not strictly a prerequisite, but the second course in a two-course sequence), and Spanish 102.

Part I of this study looked at those who enrolled in the second course online. Given that the second course was taken online, how many enrolled in the prerequisite online versus in a classroom section? Further, how did students perform depending on whether they had taken the online or classroom version of the prerequisite?

Out of 30 students who enrolled in English 102-70 in the spring, none (out of 5 who received a grade in 101-70) had taken English 101 online. All 30 had taken it in the classroom..

Out of 26 students who enrolled in Spanish 102-70 in the spring, 17 or 65.4 percent took the prerequisite in the classroom and 9 or 34.6 percent took it online. All 9 of those with the online prerequisite experience passed the spring online course, whereas only 6 out of the 17 of those with the classroom prerequisite passed. That difference was statistically significant with a probability of the results being due to chance equal to or less than 2 out of 1000.

Out of 13 students who enrolled in English 208G-70 in the spring, 9 or 69.2 percent took the prerequisite in the classroom and 4 or 30.8 percent took it online. All 4 of those with online prerequisite experience passed the spring online course whereas only 6 of the 9 with the classroom-based prerequisite experience passed. Again, that difference was statistically significant with a probability of a chance result equal to less than 5 out of 100.

We may conclude that when sufficient numbers of fall online students return for a second online course in the spring to permit a statistical comparison with those whose prerequisites were taken in the classroom, performance in the course tends to favor those with the online experience.

However, the interpretation of Part I by itself is ambiguous. It is unknown from these results alone how much the statistically better performance of the students with the online experience could be attributed to experience with the BBS system and online pedagogy versus the learning which presumably occurred through the online vehicle. Therefore, a Part II was logically required because it was essential to know how well the students with online experience (in the prerequisite) might do in a classroom course for which the

first course was prerequisite. Would these students' performance be comparable with traditionally taught students in the same course?

However, due to the relative newness of CNU On-Line, the plan that was designed to provide an answer to the above question has so far failed to provide such an answer. Based on the two semesters (94-95) alone, only one person who had taken the prerequisite online enrolled for the second course in the classroom mode. While this person was not disadvantaged by the online prerequisite, one person could not provide enough data to draw a strong conclusion. As more terms of online experience accumulate, it will be possible to gather sufficient data to test whether students with the online experience perform comparably on a second (classroom-taught) course for which the online course was prerequisite.

Nevertheless, while it is not yet possible to test by this method how well students have performed in traditional classes (as a function of online versus classroom-based prerequisites), another worthwhile observation may be made from this study. This observation concerns students' enrollment choices. It is noteworthy that of the students with prior online experience, if they enrolled at all in the second course in the following semester, they tended to choose the online mode again. In fact, this pattern, noteworthy as it is, deprived us in this study of having sufficient numbers to observe the online students in a following classroom course to make an appropriate statistical test.

In summary, students with online prerequisite experience tended to have an advantage in the second online course in a sequence over those students who did not have the online experience. Due to insufficient numbers it could not be ascertained whether students with online prerequisite experience would perform in a classroom course (the second in a sequence) at a level commensurate with students with classroom prerequisite experience. This lack of numbers, however, was due to an apparent tendency for students who enrolled in a second course in a sequence to choose the online mode if they had taken and passed the first course in that mode.

APPENDIX 11
SUMMARY OF PROFESSOR RONNIE COHEN'S REFLECTIONS ON TAKING INTRODUCTORY SPANISH BOTH ONLINE AND IN THE CLASSROOM, 1994-95

Professor Ronnie Cohen has taken the introductory Spanish course both online (101) and in the classroom (102) and has offered several observations regarding the comparison between the two from the vantage of a student learner. She cautioned that some of her comments are course-specific; however, many points could be generalized to other courses and disciplines. She also cautioned that she is much more of a "professional learner" than our average student, and therefore both subject difficulty and motivation are different in her case.

Professor Cohen first discussed what she regarded as distinct advantages of the online course compared to the classroom. The online experience puts a high premium on students becoming independent learners and sustaining independent learning. She described this experience as "immersion," a phrase which is particularly apt for the language experience. In the online course assignments in Spanish the learner was required to respond with whole sentences rather than bits of vocabulary or parts of speech such as might be elicited as responses in a face-to-face environment. Of necessity, the student had to type in a complete response, and this called for a type of immersion into the subject matter that Professor Cohen found relatively missing in the classroom course. The kind of performance which is called for is much more demanding, and that is good from a learning standpoint. On the other hand, students in this situation find it extremely easy to fall behind and may not be able to catch up.

Professor Cohen cautions that many students might find the "advantage" of the stress on independent learning to be a disadvantage in their perception. To such students, if they are asked to be independent it indicates that the teacher is not doing her job of teaching.

However, if the students put in the effort required to keep up, they would find more individualized feedback and evaluation in the online course. This aspect of the online experience is something Professor Cohen described as a "big plus." Interestingly, Professor Cohen used oral speaking skills as an example of the benefits of individualized feedback, even though oral skills cannot be communicated directly over a computer bulletin board system. The Spanish professor (Cahill) had students read specific portions of text over a telephone into a recorder. Later each student received a detailed critique of her performance; more detailed and individualized than in the face-to-face classroom situation. In the latter setting it too often happened that some students could avoid participating in more than a perfunctory way, and in any case the feedback would be limited due to time constraints.

Another big benefit of online classes according to Professor Cohen was the group work. First, as anyone who has ever taught can attest, students often can learn best by teaching others. Second, those receiving correction from another student can in turn also benefit by this individual attention from other persons beside the instructor. What happens in the latter case is

that students are often willing to take greater risks for the sake of learning in the non-evaluative context of being taught by peers. They are more willing to show what they don't know, and thus they can be corrected in all the mistakes they are willing to reveal. Another aspect of group work is that it promotes an exchange of ideas that simply does not happen when the course assignments are all individualized.

Another advantage that accrues to virtually all online courses is that of increasing students' skill and comfort level in using computers. Students who experience any phobia of computers or computer applications can hardly go through one of these courses without substantially overcoming that handicap.

Turning to actual or potential disadvantages, Professor Cohen made the following observations.

1. It is extremely easy to get behind and not be able to catch up. This disadvantage is a consequence of the intense immersion in the subject matter that is required in online classes and the number of messages (not all noteworthy) that must be read.

2. It is harder to find and exploit opportunities for conversation. In online courses, one has to work at making conversation happen--and therefore too the incidental learning that conversation can engender.

3. Finally, not having personal contact with other students is, according to Professor Cohen, in the big picture ultimately a disadvantage. Communicating and learning in the digital environment can make a fine contribution to the University's programs. It is only when this idea is extrapolated to a vision of totally substituting for, and replacing, the campus environment that Professor Cohen expresses reservations. In the real world, students also need to learn to function well in face-to-face situations; this is a goal that a digital learning environment cannot substantially help us achieve.

Professor Cohen also responded to several criticisms, often levelled at computer-managed instruction, which she feels are weak or invalid. One criticism is that students engaging in group work can receive a free ride when they do not contribute their fair share of the work. While this certainly can occur, the same risk exists in group work in either context--online or in the classroom. Furthermore, the advantages of group work, including particularly the value of exchanging ideas with ones' peers, outweigh this possible drawback. A second criticism is that because students do their work at a distance, it is easier to get away with turning in work which was done by somebody else. Professor Cohen argues that while this may be true, the difference between online courses and courses taught in the classroom has been exaggerated in this regard. Finding individuals who are both willing and capable of doing another's work probably is not that easy.

After having taught one course online, Prof. Cohen added that in her limited experience <u>her</u> learning was comparable to that of classroom courses, in some ways better and in some ways not as good.